

The Implementation of OOP (Object Oriented Programming) in Building an E-Commerce Website

Nahlah

*Department of Commerce Administration
Politeknik Negeri Ujung Pandang
Makassar, Indonesia
nazizah12@gmail.com*

Amiruddin

*Department of Commerce Administration
Politeknik Negeri Ujung Pandang
Makassar, Indonesia*

Paramudia

*Department of Commerce Administration
Politeknik Negeri Ujung Pandang
Makassar, Indonesia*

Lukman

*Graduate student of Information Technology Faculty
Universitas Hasanuddin
Makassar, Indonesia*

Abstract—OOP (Object Oriented Programming) is an object-oriented programming method. The purpose of OOP is to facilitate the development of the program by following the models that have existed in everyday life. Object-oriented programming techniques are becoming very popular today in the process of creating multi-operating system applications. This OOP is quite flexible and easily modified. The purpose of this study was to implement the OOP technique with UML modeling in building an e-commerce website for KSM Tenggara Ceria in Sinjai Regency. The benefits obtained are that the resulting website can be developed or expanded easily, becoming multistore like Lazada and Bukalapak, etc. Website design is done by using the Waterfall method which includes the stages of system analysis and needs (data readiness, software or hardware used), design stages (database analysis, business flow analysis with UML tools, user interface design), implementation stages (OOP-based coding using the PHP, HTML programming language, NetBeans editor with MySQL database.), testing stages, maintenance and development stages. The result of this study is an e-commerce website application that can be accessed via the URL: www.umkngo.com.

Keywords—Object-Oriented Programming (OOP), website e-commerce, programming language

I. INTRODUCTION

Object-Oriented Programming (OOP) techniques are now the most popular programming techniques and are widely used by programmers to replace procedure-based programming techniques [1]. OOP is the way or paradigm of programming that is object and class oriented [2] where each object has attributes along with functions that interact with each other as well as objects [3].

It's not merely a different way to write program syntax, but also a mindset on analyzing system and programming problems. With OOP, the program can be made more modular, neat, easy to understand and to be further developed without a lot of syntaxes being changed. With a class being made, other programmers can easily use it without knowing the running process of that class [4]. If we compare it with procedural programming code where codes are modeled using functions, thus the development is quite tricky because the program codes are not well organized and not separated according to their functions [5].

OOP is currently the flexible programming pattern that every software developer or programmer employs; this OOP concept applies to both web application development and standalone software development. Many programming languages and frameworks, particularly for web applications, are now structured along-side OOP techniques [6].

The purpose of OOP was created to facilitate the development of the program by following the models that already exist in everyday life. This confirms the state, behavior, and interaction of the object. It also provides benefits for freedom of development, improving quality, simplifying maintenance, enhancing capabilities in the modification, and increasing software reuse [5].

Many previous researchers have applied this OOP technique in creating websites as Rolly Yesputra did with the title of the research. "Implementation of Object Oriented Programming in Client-Server Based Application Development, Royal STMIK E-Alumni Case Study" [5]. Deni Mahdiana (2011) in his research concluded that object-oriented analysis and design methods are very helpful in determining the design of information procurement systems using Unified Modeling Language (UML) modeling [7].

Based on the description above, it is deemed necessary to develop an application that implements the Object Oriented Programming (OOP) concept in the making of an e-commerce website for the client. The website will be used in marketing its products, among others; fish meatballs, shredded fish, fish nuggets, amplang fish, and otak-otak. With the OOP concept, the website can be expanded or developed into a multistore website such as Lazada, bukalapak, and others because the OOP concept makes it possible to develop coding or applications with easier techniques. Some basic concepts of OOP include:

- Encapsulation (Class and Object)
- Inheritance
- Polymorphism [8]

The OOP concept with UML (Unified Modeling Language) tools will be applied to the PHP programming language in building the e-commerce website KSM Tenggara Ceria application in Sinjai Regency.

II. THE UNIFIED MODELING LANGUAGE (UML)

The Unified Modeling Language (UML) is one of the tools that is very reliable in the world of object-oriented system development, this is because UML provides visual modeling that allows system developers to make blueprints for their vision in a standardized form, easy to understand and equipped with effective mechanisms for sharing and communicating their designs [9], [10]. UML diagrams have the main purpose of helping project development teams communicate, explore the potential of design and validate software architecture designs or program makers [11]. UML defines several types of official diagrams, including Use Case Diagrams, Class Diagrams, Activity Diagrams, Sequence Diagrams, Collaboration Diagrams, Communication Diagrams, Statechart Diagrams, Component Diagrams, and Deployment Diagrams [12], [13]. In this study, Use Case Diagrams and Sequence Diagrams will be used.

III. METHOD

The type of research used is experimental research which uses the design and implementation of techniques into the appropriate application. The research design was carried out by implementing the waterfall method with several stages such as Figure 1 [14]. The waterfall model is the oldest and most widely used software engineering paradigm. The waterfall model proposes an approach to systematic and sequential software development that starts at the level and progress of the system in all analysis, design, code, testing, and maintenance. After each phase is defined, the stage is 'signed off,' and development continues to the next stage.

A. System and Needs Analysis Phase, which is preparing everything about:

- Hardware: hardware prepared for this Information System is a PC with a minimum of 1GB of memory, core 2 processor or intel atom, scanner and printer. Software: Windows XP, UML, Wamp Server, Apache, PHP, MySQL, and NetBeans Operating Systems.
- Data & information: data & information needed is collected from relevant sources.
- Management: This information system will succeed if it is well managed and done by people who have the right expertise at all levels.

B. Design Phase

The implementation of OOP in building e-commerce websites is in the design stage. After analyzing the system,

preparing the required data, followed by database design and business flow using UML tools. The next stage is designing the user interface, implementing OOP-based coding using the programming language PHP, HTML, *NetBeans* editor with a database using MySQL.

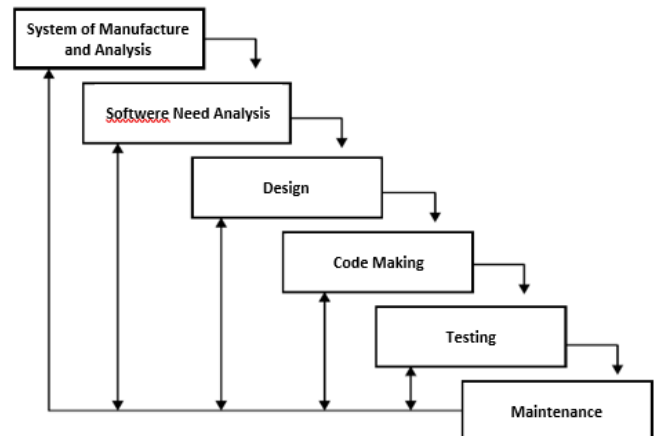


Fig. 1. Waterfall Model Based on Sommerville Reference

This research is a descriptive study with a qualitative approach conducted in collaboration between the mathematics teacher and the lecturer of the Mathematics Education Study Program. The subject is eighth-grade students. This study was conducted in three cycles which consists of three stages plan, do, and see for each cycle. Some instruments developed were teacher and students' activities observation sheets. The data were collected by observation with camcorder and field notes. The data then triangulated between the source observation result and the field notes. The data analyzed by finding the pattern of interaction through four stages: interpreting the data, reducing the data, present the data and finding the pattern of interaction.

IV. RESULT AND DISCUSSION

A. OOP Implementation in Php and MySql-Based E-Commerce Website Applications

Before the OOP concept is implemented in the application, the business flow modeling is first done using UML tools. Following are some of the modeling results that have been made. Next is to write the program code based on the business flow that has been made above using the OOP concept. The following are some examples of program codes created using the Netbeans editor.

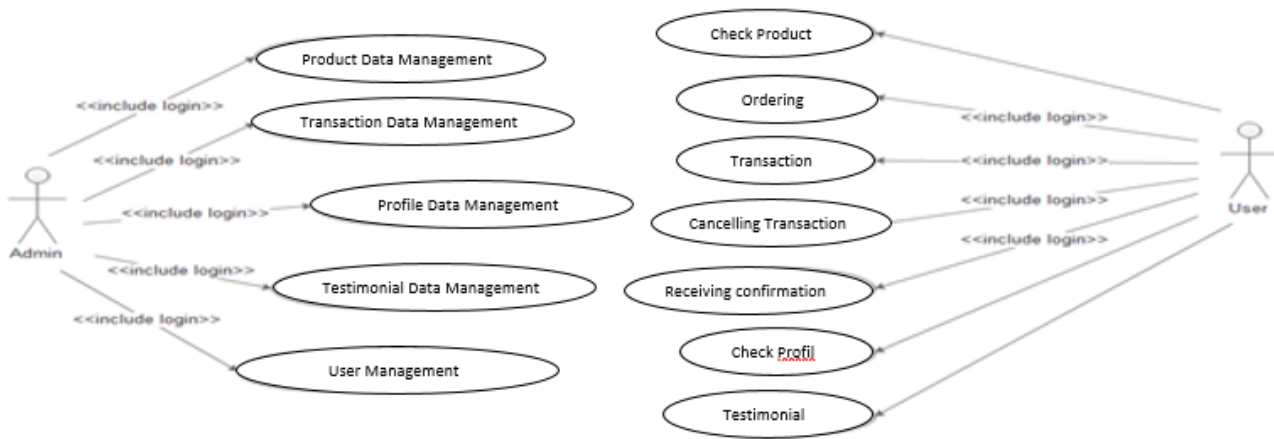


Fig. 2. Use Case Diagram

In this case, Figure 2 shows the activity which is covered by admin and also user activity. The user uses the system to make a transaction with another user even with admin. They could be ordering or canceling the product; then the admin

automatically continues to process the transaction. Admin as a provider of linking all user provide a management system to make an easy and clear transaction [15].

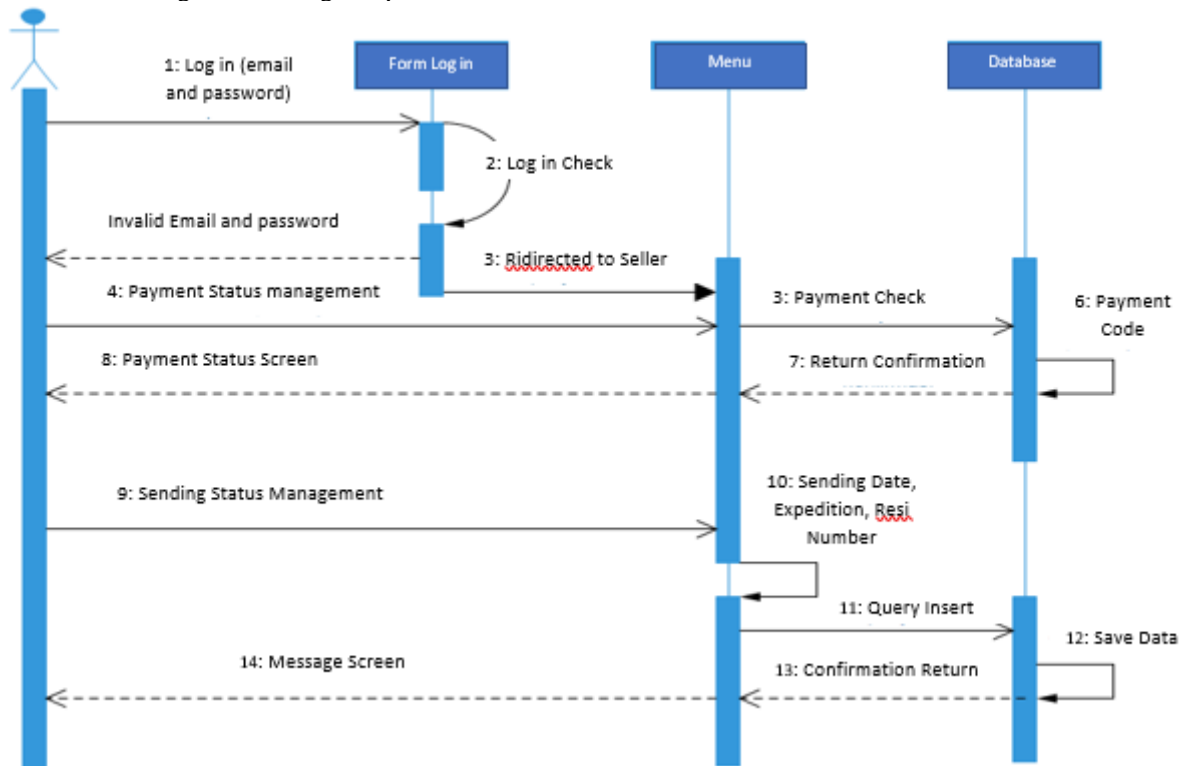


Fig. 3. Selling Menu in Crud Diagram Sequence

Figure 3 reveals how the sequence of selling product. Sequence, the user login, checking the product, paying product, then all of the selling data will save in the database.

After the seller receives payment confirmation, the seller will send them to the customer. All the transaction is controlled by admin.

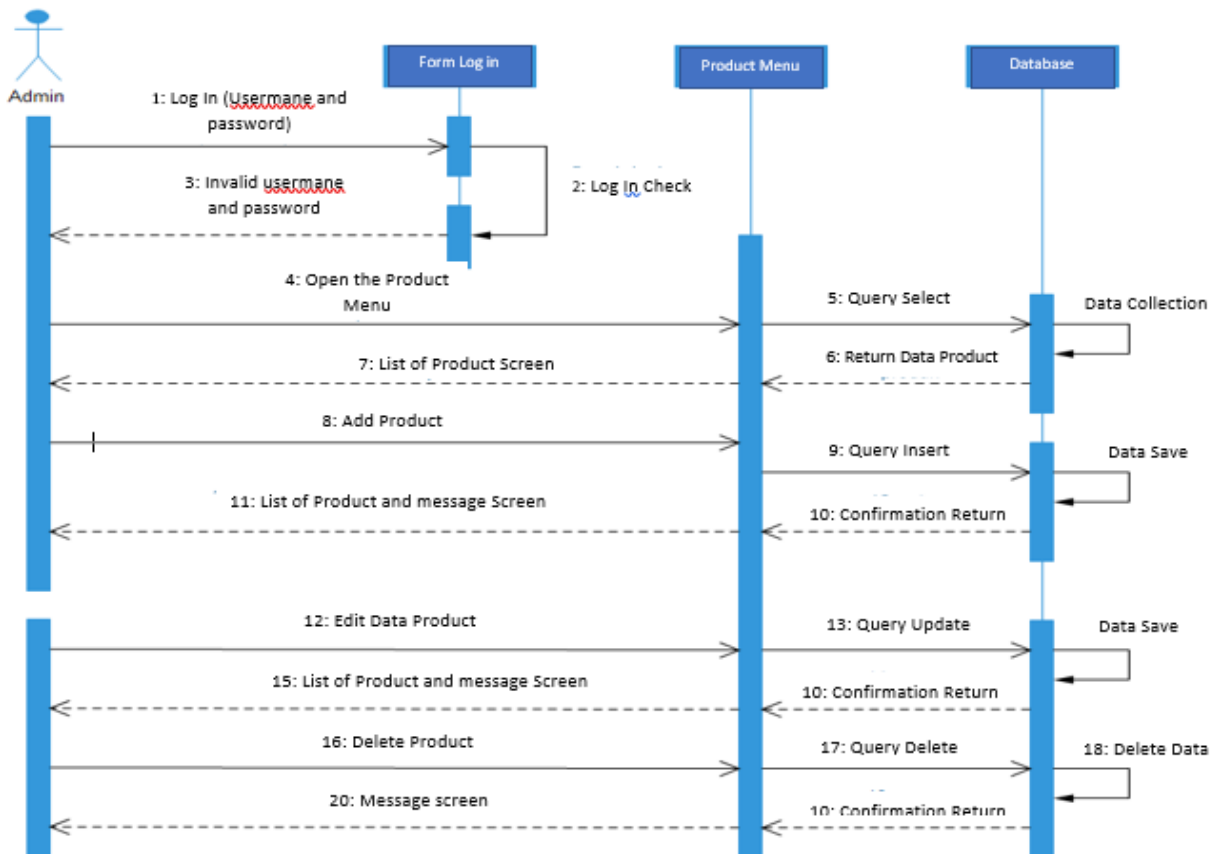


Fig. 4. Product Menu in Crud Diagram Sequence

Figure 4. describes the inputting data of the product, editing or deleting. The seller logs in to the web are then checking the product menu; the database will save the data of

the product. If the user finds the incorrect data of the product, the seller could edit and change the product information or even delete the product in the product menu.

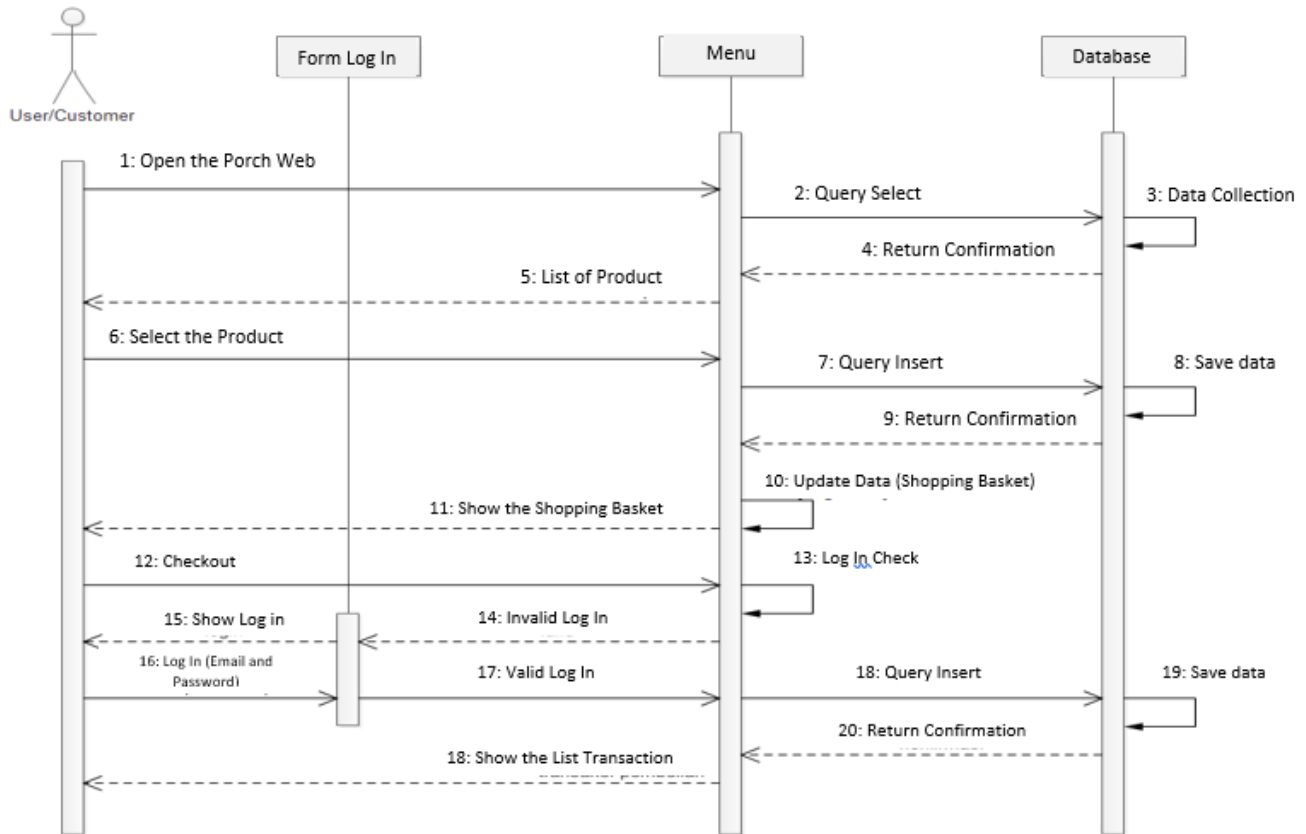


Fig. 5. Sequence Diagram of Buying Transaction

The buying scheme is showed in Figure 5. The seller and costumer could make a deal for product bridged by the web. The seller and costumer can be linked directly using the web, if they deal the costumer do payment or if denied, the

transaction will be canceled automatically. The costumer also can cancel the transaction before the payment. The admin can control all the activities of the seller and buyer easily.

```

- D:\xampp2017\htdocs\ksmceria — Atom
Selection Find Packages Help
Db.class.php x produk_ctrl.php

1 <?php
2
3 require("Log.class.php");
4 class DB
5 {
6     private $pdo;
7     private $sQuery;|
8     private $settings;
9     private $bConnected = false;
10    private $log;
11    private $parameters;
12    public function __construct()
13    {
14        $this->log = new Log();
15        $this->Connect();
16        $this->parameters = array();
17    }
18    private function Connect()
19    {
20        $this->connect = new PDO('mysql:host=localhost;dbname=ksmceria;charset=utf8', 'root', 'root');
21    }
22}

2017\htdocs\ksmceria — Atom
nd Packages Help
Db.class.php x produk_ctrl.php

1 <?php
2 if ($memberstatus == "false") {
3     header("location:?p=login&v=utama");
4 } else if($memberstatus == "true" && $j
5     header("location:?p=utama");
6 }
7 include './assets/class.upload.php';
8 $statusaksiform = "ok";
9 $jmlkosong = array();
10 $postdatas = filter_input_array(INPUT_P
11 if ($postdatas) {
12     foreach ($postdatas as $key => $value
13         ${$key} = $value;
14     }
15     switch ($aksiform) {
16         case 'tambah':
17             //echo "test";
18             $post ori = $oostdatas;

```

Fig. 6. Source Code Product with OOP Implemented

B. The result of E-Commerce Website Application

After completing, the business model continued with the design and coding using the OOP (Object Oriented Programming) Php programming language as showed in Figure 6. The results of this study are websites that can be accessed via the URL www.umkngo.com.

V. CONCLUSION

From this study, an e-commerce web application has been made, and it is named www.umkngo.com. Coding systems that are used are based on OOP (Object-Oriented Programming), so there will not be any difficulty in the developing process of this application. The Reusable Code is possible with the concept of OOP, so it's suitable to be a programming technique in massive scale to be an online multistore, such as lazada, bukalapak, and others. Source codes as such provide a website with stable response time, either done by few or many users simultaneously.

ACKNOWLEDGMENTS

We would like thank to KEMENRISTEK DIKTI No:043/SP2H/LT/DRPM/2018 for financial support.

REFERENCES

[1] J. Wulansari, Eka and Charter, "Rancang Bangun Sistem Informasi Simpan Pinjam Karyawan Menggunakan Metode Object Oriented Programming (Studi Kasus PT Arta Buana akti Tangerang)," *J. Techno Nusa Mandiri*, vol. XIII, no. 63, 2016.
 [2] W. Gata, *Asiknya Mengenal Java*. Jakarta: PT.Elex Media

Komputindo, 2017.
 [3] S. B. Sakur, *PHP 5 Pemrograman Berorientasi Objek, Konsep dan Implementasi*. Yogyakarta: Andi Publisher, 2010.
 [4] I. Bima, "Aplikasi POS Berarsitektur Three Tier Menggunakan Swing, Hibernate dan Spring," 2012. .
 [5] R. Yesputra, "implementasi Object Oriented Programming Dalam Pengembangan Aplikasi Berbasis Client-Server," 2018. .
 [6] J. G. Onu F.U., Osisikankwu P.U., Madubuike C.E., "Impacts of Object Oriented Programming on Web Application Development," *IJCATR*, vol. 4, no. 9, pp. 706–710, 2015.
 [7] D. Mahdiana, "Analisa Dan Rancangan Sistem Informasi Pengadaan Barang Dengan Metodologi Berorientasi Obyek : Studi Kasus Pt. Liga Indonesia," *J. Telemat. Mkom*, vol. 3 (ISSN 20, no. 2, 2011.
 [8] K. Wibowo, "Analisa Konsep Object Oriented Programming pada Bahasa Pemrograman PHP," *J. Khatulistiwa Inform.*, vol. 3, no. 2, 2015.
 [9] M. Jakimi, A. dan Koutbi, "An Object-Oriented Approach to UML Scenarios Engineering and Code Generation," *Int. J. Comput. Theory Eng.*, vol. 1 (ISSN :, no. 1, 2009.
 [10] S. Lee, "Unified Modeling Language (UML) for Database Systems and Computer Applications," *Int. J. Database Theory Appl.*, vol. 5, no. 1, 2012.
 [11] Havaluddin, "Memahami Penggunaan UML (Unified Modelling Language)," *J. Inform. Mulawarman*, vol. 6, no. 1, 2011.
 [12] "Sathiyaraj, R., Yadav, N.S., Prabhakar, M. (2012), 'Modeling Real Time Scheduler in OOAD Using UML',' *Int. J. Res. Educ. Methodol. Counc. Innov. Res.*, vol. 2 (ISSN:22, no. 1, 2012.
 [13] M. Rosa, A.S and Shalahuddin, *Rekayasa Perangkat Lunak*. bandung: INFORMATIKA, 2013.
 [14] D. Lestari, *Model-model Pengembangan Sistem Informasi Berbasis WEB*. Universitas Sriwijaya, 2010.
 [15] C. Huemer and P. Lops, "E-Commerce and Web Technologies," *Lect. Notes Bus. Inf. Process.*, vol. 152, no. September 2002, 2013.